

WHAT IS CLAIMED IS:

1. An exposure apparatus comprising:

air pressure measurement means for measuring air
5 pressure in a neighborhood of or inside a projection
optical system;

first correction means, including aberration
adjustment by driving a lens of the projection optical
system, for repeatedly executing correction of an
10 aberration based on the air pressure which is measured
by said air pressure measurement means; and

second correction means, including aberration
adjustment by changing a wavelength of an exposure
light source, for executing correction of an aberration
15 at a time interval longer than a repetition of the
aberration correction executed by said first correction
means, based on the air pressure which is measured by
said air pressure measurement means.

20 2. The exposure apparatus according to claim 1,
wherein said second correction means corrects more
aberrations than that of the first correction means.

3. The exposure apparatus according to claim 1,
25 wherein said first correction means performs correction
at least during a shot of an exposure, and said second
correction means performs correction in a non-shot

state of the exposure.

4. The exposure apparatus according to claim 1,
wherein said first correction means performs correction
5 from the beginning of an exposure process for a wafer
to the end of all shots of the exposure, and said
second correction means performs correction while the
wafer is exchanged after the end of said exposure
process.

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5. The exposure apparatus according to claim 1,
wherein said second correction means performs
aberration correction by changing the wavelength, or by
changing the wavelength and driving the lens.

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6. The exposure apparatus according to claim 1,
further comprising stage driving means for adjusting an
aberration by driving a wafer stage in the optical-axis
direction,

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wherein said first correction means and said
second correction means performs aberration correction
using said stage driving means.

7. The exposure apparatus according to claim 1,
25 wherein said air pressure measurement means comprises:

a first barometer for detecting an absolute value
of air pressure;

a second barometer for detecting an absolute value or a relative value of air pressure at higher speed than said first barometer; and

calibration means for calibrating an output of
5 said second barometer based on an output of said first barometer, and outputting a calibration result as the measured air pressure value.

8. An exposure apparatus comprising:

10 a first barometer for detecting an absolute value of air pressure;

a second barometer for detecting an absolute value or a relative value of air pressure at higher speed than said first barometer; .

15 calibration means for calibrating an output of said second barometer based on an output of said first barometer, and outputting a calibration result as a measured air pressure value; and

aberration correction means for performing
20 aberration correction based on the air pressure value outputted by said calibration means.

9. The exposure apparatus according to claim 8, wherein said aberration correction means performs
25 aberration correction by employing at least one of: aberration correction utilizing wavelength changing means which adjusts an aberration by changing a

wavelength of an exposure light source, aberration correction utilizing lens driving means which adjusts an aberration by driving a lens of a projection optical system, and aberration correction utilizing stage
5 driving means which adjusts an aberration by driving a wafer stage in an optical-axis direction.

10. The exposure apparatus according to claim 7,
wherein said second barometer is configured with a
10 laser interferometer.

11. An aberration correction method for correcting an aberration based on an air pressure value measured by air pressure measurement means that measures air
15 pressure in a neighborhood of or inside a projection optical system, said method comprising:

a first correction step of repeatedly executing correction of a predetermined number of aberrations based on the air pressure value which is measured by
20 the air pressure measurement means, said step including aberration adjustment by driving a lens of the projection optical system; and

a second correction step of executing aberration correction at a time interval longer than a repetition
25 of the aberration correction executed in said first correction step, based on the air pressure which is measured by the air pressure measurement means, said

step including aberration adjustment by changing a wavelength of an exposure light source.

12. A method of correcting an aberration caused by a change in air pressure in an exposure apparatus, comprising:

a calibration step of calibrating an output of a second barometer based on an output of a first barometer and outputting a calibration result as a measured air pressure value, said first barometer detecting an absolute value of air pressure and said second barometer detecting an absolute value or a relative value of air pressure at higher speed than the first barometer; and

an aberration correction step of performing aberration correction based on the air pressure value outputted in said calibration step.